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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------|-------------|----------------------|---------------------|------------------|
| 10/820,343 | 04/07/2004 | Chien Ping Lee | EICCP011X1 | 8156 |
| 22434 | 7590 | 10/28/2004 | EXAMINER | |
| BEYER WEAVER & THOMAS LLP | | | MAGEE, THOMAS J | |
| P.O. BOX 778 | | | ART UNIT | |
| BERKELEY, CA 94704-0778 | | | PAPER NUMBER | |
| | | | 2811 | |

DATE MAILED: 10/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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| | | | |
|------------------------------|-------------------------------|----------------------------|--|
| Office Action Summary | Application No. 10/820,343 | Applicant(s) LEE ET AL. | |
| | Examiner Thomas J. Magee | Art Unit 2811 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 8-15 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections – 35 U.S.C. 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3 – 5, 8, and 10 – 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Burton et al. (US 6,531,721 B1).

3. Regarding Claim 1, Burton et al. disclose a HBT comprising:

an emitter region (314) (Figure 3) of one conductivity type (n) (Col. 6, lines 1 – 10) (Col. 5, line 18),

a base region (312) of opposite conductivity type (p) (Col. 5, line 18), abutting the emitter region (314),

a collector region (330) of the one conductivity type (n) abutting the base region (312), the collector region comprising at least three layers having decreasing dopant concentrations toward the base region (Col. 6, lines 15 – 35), the layer in the collector region (336) abutting the base region (312) having the lowest doping concentration ($2 \times 10^{16}/\text{cm}^3$) (Col. 6, lines 27 – 29), and

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a subcollector region (310) of the one conductivity type (n) abutting the collector region (330), the collector region having a non-uniform doping with the lightest doping ($2 \times 10^{16}/\text{cm}^3$) (Col. 6, lines 27 – 29) near the base region (312) and heaviest doping ($5 \times 10^{16}/\text{cm}^3$) (Col. 6, lines 22 – 24) near the subcollector region (310), the heaviest doping being less than the doping ($5 \times 10^{18}/\text{cm}^3$) (Col. 6, lines 15 – 18) in the subcollector region.

4. Regarding Claims 3 and 10, Burton et al. disclose that the layer (336) in the collector region abutting the base (312) region has a dopant concentration on the order of $2 \times 10^{16}/\text{cm}^3$ and the layer (332) in the collector region abutting the subcollector region (310) has a dopant concentration on the order of $5 \times 10^{16}/\text{cm}^3$, consistent with the recitations of the instant application.

5. Regarding Claims 4 and 12, Burton et al. disclose that the subcollector has a dopant concentration of $5 \times 10^{18}/\text{cm}^3$ (Col. 6, lines 15 – 18).

6. Regarding Claims 5 and 11, Burton et al. disclose that the middle layer (334) in the collector region (330) abutting the subcollector region (310) has a concentration on the order of $3 \times 10^{16}/\text{cm}^3$ (Col. 6, lines 24 – 26), consistent with the recitations of the instant application.

7. Regarding Claim 8, Burton et al. disclose a HBT having improved safe-operating area characterized by a collector region (330) between a base region (312) and a subcollector

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region (310), the collector region having at least three layers (332,334,336) of one conductivity type (n) and decreasing dopant concentrations toward the base region (Col. 6, lines 15 – 35), the layer (436) in the collector region (336) abutting the base region (312) having the lowest doping concentration ($2 \times 10^{16}/\text{cm}^3$) (Col. 6, lines 27 – 29).

8. Regarding Claims 13 and 14, Burton et al. disclose that the one conductivity type is N type (Col. 6, lines 1 – 4; lines 15 – 35) (Col. 5, lines 18 – 21).

Claim Rejections – 35 U.S.C. 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burton et al., as applied to Claims 1, 3 – 5, 8, and 10 – 14, and further in view of Luryi (US 5,496,743).

11. Regarding Claims 2 and 9, Burton et al. do not disclose that the layer in the collector region abutting the base region is thicker than the other two or more layers in the collector region. Luryi discloses a composite (“solid material collection of more than two constituents”) Col. 7, lines 26 – 28) wherein the layer (n+) abutting the base is thicker than the other layers (n++) (Col. 5, lines 7 – 9) (Col 5, lines 16 – 18). It would have been obvious to combine the layer

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structure of Luryi with Burton et al. to obtain a HBT with higher breakdown voltages (Luryi, Col. 7, lines 26 – 29).

Claim Objections

12. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Double Patenting Rejection

13. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

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14. Claim 15 is provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of Claim 12 of copending Application No. 10/267215. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Conclusions

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to **Thomas Magee**, whose telephone number is **(571) 272 1658**. The Examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM (EST). If attempts to reach the Examiner by telephone are unsuccessful, the examiner's supervisor, **Eddie Lee**, can be reached on **(571) 272-1732**. The fax number for the organization where this application or proceeding is assigned is **(703) 872-9306**.

Thomas Magee
October 23, 2004



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800